REMARKS

Claims 1-6, 8-13, and 15-20 are all the claims pending in the application. Claims 1-20 stand rejected on prior art grounds. Claims 7, 14, and 20 are cancelled, above, and claims 13-14 stand objected to. The specification and drawings stand objected to. Applicants respectfully traverse these rejections based on the following discussion.

I. The Prior Art Rejections

Claims 1-7 and 15-20 stand rejected under 35 U.S.C. §102(b) as being anticipated by Dao, et al., (U.S. Patent No. 5,302,477), hereinafter referred to as Dao. Claims 1-7 and 15-20 stand rejected under 35 U.S.C. §102(b) as being anticipated by Schroeder, et al., (U.S. Publication No. 2003/0027057), hereinafter referred to as Schroeder. Claims 6-7 and 19-20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over either Dao or Schroeder, in view of either Levenson (U.S. Patent No. 6,251,549) or Rolfson (U.S. Patent No. 6,395,432). Claims 8-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over either Dao or Schroeder, in view of Tzu, et al. (U.S. Patent No. 5,888,678), hereinafter referred to as Tzu. Claims 13-14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over either Dao or Schroeder, in view of Tzu and in further view of either Levenson or Rolfson. Applicants respectfully traverse these rejections based on the following discussion.

The claimed invention provides a method of forming a phase shift mask wherein a first patterning is performed to expose first regions of a substrate and an additional patterning is performed to expose second regions of the substrate. In the rejection, the

Office Action argues that the prior art of record discloses exposing first and second regions of a substrate, wherein the first and second regions have a similar shape and size. However, neither Schroeder, Tzu, nor Levenson teach or suggest a method of exposing first and second regions of a substrate such that the second region comprises a similar shape and size as the first region, wherein the second region is adjacent the first region. Furthermore, neither Dao nor Rolfson teach or suggest exposing a first region of a substrate and subsequently exposing a second region of the substrate. Therefore, as explained in greater detail below, Applicants respectfully submit that the prior art of record does not teach or suggest the claimed invention.

a. The rejection based on Dao

Applicants respectfully submit that neither Dao nor Rolfson (as discussed in Section c, below), neither individually nor in combination, teach or suggest exposing a first region of a substrate and *subsequently* exposing a second region of the substrate. Rather, as more fully described below, both Dao and Rolfson disclose methods of exposing first and second regions of a substrate *concurrently*.

Conversely, the claimed invention comprises "performing a first patterning ... to expose a first region of said ... substrate ... [and] performing additional patterning ... to expose a second region of said ... substrate", as defined by independent claims 1 and 15, and "performing a first patterning ... to expose first regions of said ... substrate ... [and] performing additional patterning ... to expose second regions ... of said ... substrate", as defined by independent claim 8. Moreover, as illustrated in Figures 4B, 5B, and 8 of

Applicants' disclosure, the method exposes a first region 114 of the substrate (Figure 4B and item 800 of Figure 8). In a subsequent step, the method exposes a second region 116 of the substrate (Figure 5B and item 804 of Figure 8).

The Office Action argues that Dao discloses methods of fabricating a phase-shifted mask, wherein a *first region 53* is formed prior to a second region 27 (Office Action, p. 5, para. 1, sentences 2-3). This argument is inconsistent with the Office Action's argument that *region 24*, and not item 53, is analogous to the first region of the claimed invention (See Office Action, p. 5, para. 1, sentence 4, wherein the Office Action asserts that "a first (etched) rectangular region 24 and the second rectangular region 27 are similarly shaped and sized").

Applicants submit that if the Office Action is correct that item 53 is analogous to the first region of the claimed invention, then the first region does not have a similar shape and size as item 27 (which the Office Action asserts is analogous to the second region of the claimed invention (Office Action, p. 5, para. 1, sentences 3-4)). As illustrated in FIGS. 8-10 of Dao, item 53 has a different shape and size as item 27. Specifically, item 53 comprises a continuous cross-sectional area of the substrate, whereas item 27 comprises two separate cross-sectional areas of the substrate. This is different from the claimed invention because, as illustrated in Figures 5A, 6A, and 7A of Applicants' disclosure, the first region 114 has a similar shape and size as the second region 116. Thus, Dao would fail to teach the claimed feature wherein "said second region comprises a similar shape and size as said first region" as defined in independent

claims 1 and 15, and wherein "said second regions comprise similar shapes and sizes as said first regions", as defined by independent claim 8.

On the other hand, however, if the Office Action is correct that item 24 is analogous to the first region of the claimed invention, Applicants submit that item 24 is not exposed before item 27 (which the Office Action asserts is analogous to the second region of the claimed invention (Office Action, p. 5, para. 1, sentences 3-4)). Rather, as illustrated in FIGS. 7-10 of Dao, item 24 and item 27 are exposed concurrently (specifically FIG. 10).

In addition, FIGS. 11- 25 illustrate alternative methods of forming the apparatus of Dao, wherein item 24 and item 27 are also exposed concurrently (specifically FIGS. 13, 19, and 22). Moreover, Applicants note that item 24 and item 27 are not adjacent one another. Thus, Dao would fail to teach the claimed feature of "performing a first patterning ... to expose a first region of said ... substrate ... [and] performing additional patterning ... to expose a second region of said ... substrate ... wherein said second region is adjacent said first region", as defined by independent claims 1 and 15, and "performing a first patterning ... to expose first regions of said ... substrate ... [and] performing additional patterning ... to expose second regions ... of said ... substrate ... wherein said second regions are adjacent said first regions", as defined by independent claim 8.

b. The rejection based on Schroeder

Applicants respectfully submit that neither Schroeder, Levenson, nor Tzu (as discussed below in Sections c and d), neither individually nor in combination, teach or suggest a method of exposing first and second regions of a substrate, wherein the second region comprises a similar shape and size as the first region. Such a feature is defined in independent claims 1 and 15 using the following language: "said second region comprises a similar shape and size as said first region" and in independent claim 8 using the following language: "said second regions comprise similar shapes and sizes as said first regions". Moreover, as illustrated in Figures 5A, 6A, and 7A of Applicants' disclosure, the second region 116 has a similar shape and size as the first region 114.

The Office Action argues that Schroeder discloses a second region 460 that has a similar shape and size as a first region 458 (Office Action, p. 6, para. 1, last sentence). Applicants' respectfully disagree with such a conclusion. As illustrated in FIGS. 6a and 6b of Schroeder, the region 460 is much smaller in size as the region 458. In fact, the region 458 is nearly twice as large as the region 460. Therefore, there is a fundamental difference between the claimed invention and Schroeder because Schroeder teaches different sized first and second regions whereas the claimed invention is different because, as defined in independent claims 1, 8, and 15, the second region comprises a similar shape and size as the first region.

c. The rejection based on Dao or Schroeder in view of Levenson or Rolfson

In regards to Levenson, Fig. 16 illustrates underlying active areas 160 and 162, which clearly comprise different shapes and sizes. Moreover, Fig. 25 illustrates two

phase shift areas 256. However, the phase shift areas 256 are not adjacent one another as portions of resist 252 and phase shift material 254 separate the two phase shift areas 256. Once more, there is a fundamental difference between the claimed invention and Levenson because Levenson teaches different sized first and second regions and first and second regions that are separated by semiconductor components. Conversely, as defined in independent claims 1, 8, and 15, the claimed invention is different because the second region comprises a similar shape and size as the first region, wherein the second region is adjacent to the first region.

In regards to Rolfson, FIGS. 1, 2, 5, and 6 illustrate successive processing steps of forming alternating phase shift regions 32 and 34 (See "Brief Description of the Drawings" section, col. 3, lines 4-14). Particularly, phase shift regions 32 and 34 are formed simultaneously in the processing step shown in FIG. 5. Nothing within Rolfson teaches or suggests exposing or otherwise forming a first region prior to a second region. Conversely, the claimed invention exposes a first region of the substrate and subsequently exposes a second region of the substrate. Therefore, Applicants respectfully submit that Rolfson, either individually or in combination with any of the other cited prior art references, does not teach or suggest "performing a first patterning ... to expose a first region of said ... substrate ... [and] performing additional patterning ... to expose a second region of said ... substrate", as defined by independent claims 1 and 15, and "performing a first patterning ... to expose first regions of said ... substrate ... [and] performing additional patterning ... to expose second regions ... of said ... substrate", as defined by independent claim 8.

Accordingly, it is Applicants' position that the proposed combination of Dao or Schroeder and Levenson or Rolfson would not have resulted in the claimed invention. More specifically, as discussed in Sections a and b, above, both Dao and Schroeder teach against the claimed invention by teaching different shaped and sized first and second regions. Further, Dao teaches against the claimed invention by teaching simultaneously forming first and second regions that are separated by semiconductor components. Moreover, as discussed in this section, Levenson teaches against the claimed invention by teaching different shaped and sized first and second regions that are separated by semiconductor components; and, Rolfson teaches against the claimed invention by teaching simultaneously forming first and second regions.

d. The rejection based on Dao or Schroeder in view of Tzu

Applicants first note that the second pattern 39 is not adjacent the first pattern 37 (i.e., portions of the opaque material 30 and the resist layer 32 separate the second pattern 39 from the first pattern 37). Therefore, there is a fundamental difference between the claimed invention and Tzu because Tzu teaches first and second regions that are separated by semiconductor components, whereas the claimed invention is different because the second region is adjacent the first region. As such, Tzu does not teach the claimed feature "wherein said second region is adjacent said first region", as defined by independent claims 1 and 15, and "wherein said second regions are adjacent said first regions", as defined by independent claim 8.

Moreover, as illustrated in FIGS. 10 and 11, the second pattern 39 does not have a similar shape and size as the first pattern 37. Specifically, as noted in the "Brief Description of the Drawings" section of Tzu (col. 3, lines 40-49), FIG. 10 shows a cross section view of the completed mask having a rim type attenuating phase shifting pattern (i.e., the second pattern 39) for *small* contact holes in one region of the mask and a binary mask pattern (i.e., the first pattern 37) for *large* contact holes in another region of the mask. Additionally, FIG. 11 shows a top view of a mask having a rim type attenuating phase shifting pattern (i.e., the second pattern 39) for *small* contact holes and a binary mask pattern (i.e., the first pattern 37) for *large* contact holes. Therefore, there is a fundamental difference between the claimed invention and Tzu because Tzu teaches different shaped and sized first and second regions, whereas the claimed invention is different because the second region comprises a similar shape and size as the first region.

Therefore, contrary to the position taken in the Office Action, Tzu does not teach or suggest the claimed feature of wherein "said second region comprises a similar shape and size as said first region, wherein said second region is adjacent said first region" as defined by independent claims 1 and 15, and wherein "said second regions comprise similar shapes and sizes as said first regions, wherein said second regions are adjacent said first regions", as defined by independent claim 8.

Accordingly, it is Applicants' position that the proposed combination of Dao or Schroeder and Tzu would not have resulted in the claimed invention. More specifically, as discussed in Sections a and b, above, both Dao and Schroeder teach against the claimed invention by teaching different shaped and sized first and second regions.

Further, Dao teaches against the claimed invention by teaching simultaneously forming first and second regions that are separated by semiconductor components. Moreover, as discussed in this section, Tzu teaches against the claimed invention by teaching different shaped and sized first and second regions that are separated by semiconductor components.

e. The rejection based on Dao or Schroeder in view of Tzu, and Levenson or Rolfson

It is Applicants' position that the proposed combination of Dao or Schroeder in view of Tzu, and Levenson or Rolfson would not have resulted in the claimed invention. More specifically, as discussed in Sections a and b, above, both Dao and Schroeder teach against the claimed invention by teaching different shaped and sized first and second regions. Further, Dao teaches against the claimed invention by teaching simultaneously forming first and second regions that are separated by semiconductor components. Moreover, as discussed above in Section d, Tzu teaches against the claimed invention by teaching different shaped and sized first and second regions that are separated by semiconductor components. Additionally, as discussed above in Section c, Levenson teaches against the claimed invention by teaching different shaped and sized first and second regions that are separated by semiconductor components; and, Rolfson teaches against the claimed invention by teaching simultaneously forming first and second regions.

Therefore, it is Applicants' position that the cited references, neither individually nor in combination, do not teach or suggest many features defined by independent claims 1, 8, and 15 and that such claims are patentable over the prior art of record. Further, it is Applicants' position that dependent claims 2-6, 9-13, and 16-20 are similarly patentable, not only because of their dependency from a patentable independent claims, but also because of the additional features of the invention they defined. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections.

II. Formal Matters and Conclusion

With respect to the rejections to the claims, the claims have been amended, above, to overcome these rejections. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the rejections to the claims.

With respect to the objections to the specification, the abstract and paragraphs 0006, 0007, 0019, and 0023 have been amended, above, to overcome these objections. Applicants submit that the amendments to the specification are merely semantic and modify grammatical objections; thus, the amendments contain no new matter. Moreover, Applicants submit that the terms "TAT" and "RPT" are acronyms commonly known to those having ordinary skill within the art. With respect to the objections to the drawings, replacement drawing sheets are attached hereto, to overcome these objections. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the objections to the specification and drawings.

In view of the foregoing, Applicants submit that claims 1-20, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary. Please charge any deficiencies and credit any overpayments to Attorney's Deposit Account Number 09-0456.

Respectfully submitted,

Dated: 6/13/06

Duane N. Moore
Registration No. 53,352

Gibb I.P. Law Firm, LLC
2568-A Riva Road, Suite 304
Annapolis, MD 21401
Voice: (410) 573-6501
Fax: (301) 261-8825
Customer Number: 29154